



The Raleigh Amateur Radio Society's **EXCITER**

GET INVOLVED

- RARS General Membership meeting: Second Tuesday of the month.
- The RARS net meets every night except Saturday @ 8 p.m. on 146.640.
- The RARS Technical & Trader's net: Saturdays @ 8:00 PM on 146.64.
- RARS meets for a monthly dinner on the First Tuesday of each month. Its at 6:30PM at the Golden Corral Restaurant, 6129 Glenwood Ave., Raleigh.



PUBLIC SERVICE EVENTS

Interested in helping? Visit
<http://www.rars.org/public-service.php>

frequently for our 2016
ham public service
schedule.

RARS General Meeting

Topic: Modern Methods to Learn the Morse Code
by Dan Atchison, N3ND and Arduino CW
Trainer by Tom Lewis, N4TL

Date: September 13, 2016

Time: Meeting at 7:30 p.m.

Informal gathering and refreshments from 7 - 7:30 p.m.

Where: Ridge Road Baptist Church. 2011 Ridge Rd., Raleigh
New HAM / Elmer meeting, 6:00 p.m. before member meeting

Tadd Torborg, KA2DEW, Elmer Coordinator

[Click here for more information.](#)

RARS President's Message

Well, Labor Day has come and gone and we're heading toward the fall of the year. I'm sure a good number of you made it to the Shelby Hamfest and came home with a lot of new/old toys and/or projects. Hopefully you found that shiny new HF rig or that rare dusty boatanchor you had been seeking.

Plans are also in progress for the 59th edition of Jamobree-on-the-Air (JOTA), sanctioned by the Boy Scouts of America. JOTA is the largest single event in Scouting and RARS is proud to once again be affiliated with this great event. Stay tuned for more in-

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RARS Officers

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The Raleigh Amateur Radio Society

The Raleigh Amateur Radio Society, Inc. (RARS) was founded in 1969 and continues to serve and support the amateur radio community in the greater Triangle area. In 1999, the society incorporated a new RARS and obtained 501(c)(3) non-profit tax status.

The objectives of the club are to promote worldwide friendship through amateur radio; to be of public service by providing radio communications in times of disaster, emergency, or civic needs; to educate members in radio technique, and to provide training classes to assist in obtaining amateur radio licenses.

Anyone interested in amateur radio is eligible to apply for membership. Dues for regular licensed amateurs are \$18 per year (from July 1 through June 30). Additional immediate family members pay \$5 each per year. Dues for licensed amateurs older than 59 or younger than 16 are \$12 per year. Dues for non-licensed associate members are \$9 per year. Applications for membership may be obtained from the treasurer or on the RARS website (www.rars.org).

Exciter

The Exciter is the official newsletter of the Raleigh Amateur Radio Society. It appears each month as a PDF on the RARS website at www.rars.org. Members receive email notification when the latest version is available. Please provide your email address to the Treasurer.

The Exciter welcomes articles, advertisements, and other contributions. To submit a piece to the newsletter, please contact the Editor. The Editor reserves the right to edit any and all pieces. The submission deadline for each month's Exciter is the third Friday of the preceding month. All submissions must be final. Drafts are not accepted.

The views expressed in the Exciter are those of the individual authors and do not necessarily reflect the views of the Editor or RARS.

Tom Lewis, N4TL, editor (editor@rars.org)

For Your Information

RARS General Meeting

Date: Second Tuesday of each month

Location: Ridge Road Baptist Church 2011
Ridge Road Raleigh, NC, 27607

Time: People begin arriving at 7 p.m. The meeting officially begins at 7:30 p.m.

RARS Monthly Dinner

All members and guests are welcome to the monthly (first Tuesday) RARS Supper, 6:30PM, at the Golden Corral Restaurant, 6129 Glenwood Ave., Raleigh. Informal and Dutch, just bring your appetite and best rag to chew. 73, Chuck, K4HF

RARS Repeaters in Raleigh

146.64-, 444.525+ (82.5) and

145.13- (82.5), (82.5 is the tone freq)

Join us for the nightly RARS net at 8 p.m. on the 146.640 repeater. All hams holding a Technician class license or higher are invited to check in. We welcome both RARS and non-RARS members to the net.

There is a net Listing on the RARS website click here. <http://www.rars.org/nets.php>

VE Testing

The RARS VEs will accept walk-in testing in February, May, August and November at 5:30PM, prior to RARS membership meetings at Ridge Road Baptist Church; the RARSfest in April; the Cary Swapfest in July; the JARS-Fest in November; and following RARS license classes. Please bring a photo ID, your original and a copy of your current license, your \$14 exam fee, and any valid CSCEs that prove passing elements beyond that of your current license. Visit www.rars.org for more information.

President's Message continued

formation on JOTA.

Autumn also brings the elections. No, I'm not talking about Trump/Clinton or McCrory/Cooper. Nominations are being made for various offices in RARS. If you are interested in filling one of the various offices in RARS, please contact Chuck, K4HF, or Murray, K4MHM. This is a great opportunity to take your amateur radio activity to the next level and have a voice in the future of RARS.

As summer comes to a close and weekend trips to the beaches and lakes change into westward trips to the beautiful mountain vistas of Variety Vacationland, I hope you had a great summer and are looking forward to the cooler fall weather. This would be a great opportunity to pack up your portable station and take part in the ARRL's National Parks on the Air events. There are several designated national parks in North Carolina and the neighboring states. Just another way to enjoy Ham Radio!

73,

Dennis

NC4DK

RARS September Birthdays

Marv	KM4MDY	09/01
Jimmie	KM4DJR	09/02
Ryan	KM4KRV	09/02
Dave	KK4BPM	09/02
Wilbur	WD4RDT	09/03
Andy	KD4FHF	09/04
Carol	KI4TRH	09/04
Mary Jo	K4MJL	09/05
Lou	K4BYN	09/07
Greg	N0GE	09/11
John	N4YRB	09/12
Sam	NC4SJ	09/13
Al	NC4AL	09/13
Pat	KM4MNG	09/14
Karen	KA9UJH	09/14
Robert	W4MBD	09/16
Rod	KI4LSN	09/20
Charles	W2WNC	09/20
Larry	K4MWE	09/22
Justin	AJ4MJ	09/25
Steve	KI4YXJ	09/25
Ted	KB8LMR	09/27
Gregory	W4GXS	09/27

Future Hamfests

A full list of Hamfests can be found at the [ARRL website](#).

09/24/2016 | [FreeGate 2016](#)

Location: Greensboro, NC

Type: ARRL Hamfest

Sponsor: Qorvo Amateur Radio Club

Website: <http://kd4rf.org>

11/20/2016 | [IARSFest 2016](#)

Location: Benson, NC

Type: ARRL Hamfest

Sponsor: Johnston Amateur Radio Society

Website: <http://www.jars.net>

03/10/2017 | [Charlotte Hamfest](#)

Location: Concord, NC

Type: ARRL Hamfest

Sponsor: Mecklenburg Amateur Radio Society

Website: <http://www.charlottehamfest.org>

04/15/2017 | [Roanoke Division Convention \(Raleigh Hamfest\)](#)

Location: Raleigh, NC

Type: ARRL Convention

Sponsor: Raleigh Amateur Radio Society

Website: <http://rars.org/rarsfest>

New Member

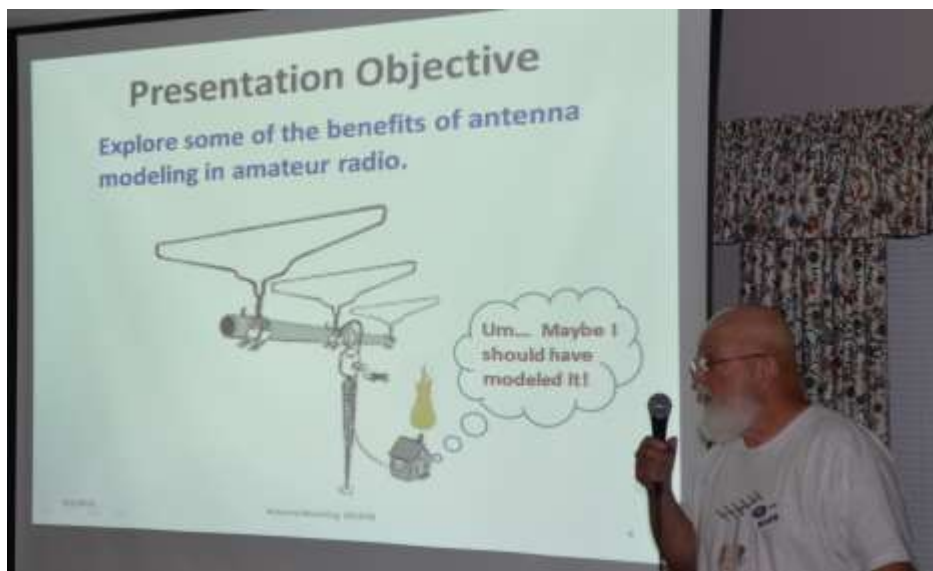
Howard Ritter, Jr N7EXN

Free windows 10 book

There is a free book about Windows 10 at this URL.
windowsitpro.com/windows-10/microsoft-press-releases-free-windows-10-ebook-written-ed-bott.

Thanks to Charles Strickland (WA4OSS) for letting us know.

August 9 RARS meeting Presentation



Fred Benson NC4FB gave a presentation on Antenna modeling. The presentation had a lot of detail on slides and can be found on NC4FB.org with a password of "rars". Fred described the origin and evolution antenna modeling and then worked through an example based on the use of AutoEZ and EZNEC, which are relatively inexpensive programs for modeling. A free app called 4nec2 is available.



During the RARS meeting the Door prizes were won by: Matt KE5BNZ chose the \$25 gift certificate. Lowell, K4EUP chose the PSK31 Guide. useful. Frank KA2FWC chose the RFI Guide. Robin (no call) won the ARRL calendar which is still half usable.

The New Hams meeting

The New Hams meeting is held every month before the regular RARs meeting. We'll try to start by 6pm. We try to address topics in a manner that will be of help to hams in their first year of operation.

At last month's meeting, Billy KE4VNC and Nathan KM4DVE, did a presentation on APRS or Automatic Position Reporting System. APRS lets a ham send their position and short text messages, manually or automatically, to everybody within range, automatically relaying across packet radio tower stations, to be received locally or via Internet. The APRS.FI web sites displays the calls of everybody in a region who is active, or can show the snake trail of a ham's movement across a

map. Billy showed a movie he shot while he watched the track of an aircraft as received on his IC7000 and PC. The movie also demonstrated using APRS.FI web site to show the historical track of that contact. Billy and Nathan had a Yaesu FT60 handie talkie with mobile-link Bluetooth TNC and a smart phone as a display, and a Yaesu VX8DR handie talkie which performed the transmission of location. They could show the location of the VX8DR HT in real time on the FT60+smartphone entirely using ham radio. For more information on this system, see <http://www.aprs.org> and <http://aprs.fi>



Billy KE4VNC presenting at the new hams meeting

Continued on the next page

Attendees to the August meeting included new hams, licensed in the past couple of years:

NC4FG Fin

KM4KRV Ryan

KW4TI Dan

KM4DVE Nathan

N4MH Rob

W4CRG Craig

KM4NBO Keith

and a really new ham, Kirk, who just took his exam.

Jim also signed the book but we don't have a call sign for him. Perhaps he's even newer yet?

In addition we had our experienced hams, KE4VNC Billy, W4MY Marty, AB4OZ Alan, N1FUA Richard.

In September we may talk about mobile installations, home construction projects, repeaters, or we may do a 40m SSB hands-on demo out front. We'll see how the fortunes and the weather co-operate.

Recap of past meetings

Feb 2016 - Satellite antennas and discussion of working the AO50 FM satellite

Mar 2016 - hands on building of 2m antenna from copper wire plus SWR measurement

Apr 2016 - short hands-on-demo of 40m operation (in the rain) talked to SC and GA -- Fox hunting transmitter demo, public service bikathon and Baofeng HT discussion

May 2016 - hands-on-demo of 40m operation - a dozen of our new hams talked to Troy NY

Jun 2016 - RepeaterBook.com show-and-tell and Shrink Wrap tubing hands-on demo

Jul 2016 - Antenna selection and performance - many 2 meter antennas shown

Aug 2016 - APRS packet and grounding system

Tadd Torborg, KA2DEW,

Elmer Coordinator

tadd@mac.com,

Raleigh NC FM05pv

General Class License Course

Raleigh Amateur Radio Society

RARS.org

Original Announcement Date: August 23, 2016

In order to be awarded a General Class license by the FCC, one must pass the Technician Class (Level 1) exam addition to the General Class exam.

When: Oct 1, 8, 15, 22 start at 8:30 a.m. and end around 1:00 p.m.

Where: Raleigh, NC. Specific location will be provided upon pre-registration.

Volunteer Instructor: Mike Murphy, WA4BPJ, has an Extra Class license and has been teaching since the 1970s and has conducted as many as 60 courses. In addition to this course, he also teaches the Amateur Extra courses.

Tuition: \$10.00 (payable at the first session)

Course Text: The required manual is the current edition of: The **ARRL Ham Radio License Manual - Level 2 General, 8th Edition (ISBN: 978-0-87259-811-9)** and is available online (i.e. ARRL, Amazon, etc.). **For errata**, Google “ARRL General Manual errata”

Examination: An optional examination is scheduled for the students’ convenience in the afternoon of the last session. The exam is conducted by the RARS Volunteer Examiners - not the instructors. There is a separate fee.

Pre-Registration: E-mail me with your **phone number** and **call sign**. A registration form and other details will be e-mailed to you.

This course is also listed on the ARRL Website at: “Find a Class.”

Next Course: Technician Class is tentatively scheduled to start: early 2017

You are probably on a contact list. E-mail me if you want to be deleted from this list.

Murray Merner, K4MHM

RARS Education Director

W4DXCC AND CONTEST CONVENTION SET FOR SEPTEMBER

The 12th Annual W4DXCC DX and Contest Convention is set for Friday and Saturday, September 23-24, in Pigeon Forge, TN. The ARRL-approved operating specialty convention will feature “Ham Radio Bootcamp,” which covers things every ham should know – kind of like the Elmer you may not have had. The presentation schedule is replete with DX and contest fare, including presentations on the TX3X Chesterfield Island, K5P Palmyra Atoll, South Sandwich and South Georgia, and Heard Island DXpeditions. Ward Silver, N0AX, will offer his contest operating tips

and tricks. For further information, see <http://www.arrl.org/news/w4dxcc-dx-and-contest-convention-set-for-september> (sources: Dave Anderson K4SV, ARRL website)

National Parks On The Air

The Great South Bay Amateur Radio Club put the White house on the air. There is a good video of the activation at this website.

<https://vimeo.com/178760910>

Future RARS Presentations

10/11/2016	RARS Officers nominations RARS Auction	Election committee & Rick Kelly-Crapse, KB4TKQ
11/8/2016	RARS Officers election and Show and Tell. Bring something of interest that you have built this year or previous years, maybe years ago. Be prepared to show it off and tell about it. The time will be limited so everyone can have time to show off their item.	Election committee & Members for Show and Tell
12/13/2016	RARS pot luck Holiday party. Sign up at the RARS website. RARS Officers induction.	Election committee

59TH ANNUAL BSA JAM-BOREE ON THE AIR

Jamboree-on-the-Air, or JOTA, is the largest Scouting event in the world. It is held annually the third full weekend in October. JOTA uses amateur radio to link Scouts and hams around the world, around the nation, and in our community.

This year's event will be held on **Saturday, October 15** from **10:00pm to 2:00pm** (or longer if needed). We will setup and operate on the lawn at the Church of Jesus Christ of Latter-Day Saints at **5060 Six Forks Road** in North Raleigh. This venue offers a large parking lot for visitors and a large front lawn for staking out antenna guy lines and setting up tents. Power and restroom facilities can be easily accessed in the building and we believe that the proximity to Six Forks road will result in a few drive by visitors.

We are looking for volunteers that can help in many different capacities. Here are some ideas for things you can do to help out:

Stand around and talk about Amateur Radio to visitors. (Isn't that easy enough?)

Prepare some sample diagrams and explanations for showing how radio works and how signals can be transmitted around the world as well to the nearest repeater.

Help with designing QSL cards, participation certificates, publicity, etc.

Attend Scout meetings to discuss the event.

Organize activities such as kit building, soldering practice, SSTV, FSTV, packet radio, and weather satellite reception. The simplest of things, such as a closed-circuit RTTY station, can generate a great deal of excitement.

Help with setup and tear-down of the antennas, tents and equipment.

Offer to setup and run a digital station, a Winlink station, a Echolink station, or any other mode that interests you.

Offer to train Scouts for the Radio Merit Badge. As an aside, the largest Merit Badge Clinic on the East Coast is on November 11th and 12th in the Raleigh area. You can volunteer to teach the Electronics, the Electricity, or the Radio Merit Badges during this clinic and we can introduce those Merit Badges during JOTA.

Help Scouts make and log their contacts. The goal is to involve as many Scouts as possible in making a contact. It is not to maximize the number of contacts or the distance of the contacts; it's about the experience for the Scouts.

If you would like to get involved, please contact Robert Cox (N4MN) at rob-ert.m.cox@gmail.com.

You can also follow us on Facebook: [JO-TA.Raleigh](#) and on Twitter: [JOTA_Raleigh](#)

The official email address for JOTA is: JO-TA.Raleigh@gmail.com

Robert Cox (N4MN) is a fairly new Amateur Radio Operator, an ARRL and W5YI VEC, an ARRL and RARS member. He is an Eagle Scout and has been active in Scouting as a leader and advisor for over 15 years. Rob is currently the Scoutmaster for Troop 310 and has previously served as a BSA Venture Advisor (twice), a Charter Organization Representative, an Assistant Scoutmaster (twice), as LDS Merit Badge Clinic building captain and as a Merit Badge Counselor.

RARS to be a major exhibitor at UoS 2016

On Saturday November 5, the local Occoneechee Council for the Boy Scouts of America (BSA) will host its 12th Annual University of Scouting.

The University of Scouting is an annual training event for Cub Scout, Boy Scout, Varsity, and Venturing leaders. This 1-day training conference is for leaders from the entire council (all 10 [districts](#)) and takes place in a festive atmosphere. Classes are taught by experienced volunteers who share not just their knowledge, but their passion about their subject.



For the past two years, representatives of both RARS and ARRL were exhibitors and found the event to be a wonderful opportunity to network with Scouting leaders (called Scouters), as well as answer any questions anyone might have about amateur radio, licensing and how the technology and the hobby might benefit Scouting.



If you are unfamiliar with the University of Scouting, the rest of this article will provide more details.

If you would like to help volunteer at the RARS exhibit booth, contact Murray Merner, K4MHM at K4MHM@arrl.net."

What is University of Scouting

The University of Scouting is the local council's largest training event. It is a fun filled, hands-on supplemental training event and an opportunity to network with other Scouters. This one day training event is designed for ALL Cub Scout, Boy Scout, Sea Scout and Venturing Leaders. In addition, there will be training opportunities for Venturing youth and Boy Scouts 14 years and older in the Venturing Youth College and the Sea Scout College.

Sessions are led by experienced volunteers whose training enhances your ability to deliver a fun and exciting program to your Scouts. Care is taken to make sure that sessions do not duplicate training found in basic leader training courses. Sessions are focused on ways to improve Scouting directly in your Pack or Troop.

Every registered leader, as well as any interested parent or guardian of a Scout, is invited to this learning extravaganza.

The University of Scouting is also a time for experienced, new, and prospective leaders to share ideas and see what other troops, teams, crews, and packs are doing. With more than 127 classes to choose from [offered over six 1-hour sessions], University of Scouting has something for everyone -- and a wonderful day well spent.

The Occoneechee Council's University of Scouting is divided into five separate "colleges".

General Studies College sessions are topics that relate to all Scouting programs.

Cub Scout College sessions focus on the Cub Scout program.

Boy Scout College sessions focus on the Boy Scout program.

Venturing College sessions focus on the Venture Scout program.

Sea Scouting College including United States Power Squadron Seminars

You can choose any session in any college. Mix and match to make the most out of your experience.

Sessions cover many topics across five different colleges including helps for new leaders, outdoor skills, advancement, creative activities, great ceremonies, Wood Badge, youth leadership training, Dutch oven cooking, unit and district administration, and much, much more.

New this year at University of Scouting! ... "**Expo at the U**" will be a huge midway where organizations like parks, museums, and businesses can display how they can help you deliver a great program to your Scouts. Think of it as a trade show for Scouters! The Expo will be open during periods 2,3, 4, and during lunch. This will be a new feature that you won't want to miss.

University of Scouting Location:

Wake Technical College

9101 Fayetteville Road

Raleigh, NC, 27603

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What is University of Scouting

Date reminder Flyer:

<http://www.ocscouts.org/wp-content/uploads/2016/06/2016-UoS-Save-the-Date.pdf>

Course Catalog:

<http://www.ocscouts.org/wp-content/uploads/2016/09/2016-UoS-CourseCatalog.pdf>

Chancellor Email Address:

ocuoschancellor@gmail.com

Event Link:

<https://occoneechee.tentaroo.com/>

Follow them on FaceBook @OCUoS



Members of the RARS Technician Class

It is being held during August and September.

Thanks to Murray for sending it to the Exciter.

Youth Director

At the RARS Board meeting on Aug 16, 2016, the Board approved the motion to have a Youth Director on the RARS Board of Directors. (This position must meet all the requirements of any other Director.) This is a progressive step forward in recognizing the importance of our youth to the future of Amateur Radio *and* RARS. It also recognizes the unique experiential opportunity that Amateur Radio and RARS provide to youth. STEM (Science Technology Engineering and Math) have become a relatively recent awareness that our schools and life experiences are not preparing our youth for the industrial future of our county. Amateur Radio provides that technological experience since we can't rely on real life experience.

Consumer technology has surpassed us. A good example is the automobile. A few years ago we could change the sparkplugs, oil, oil filter, and timing, put water in the radiator and battery of our cars. We took clocks and radios apart. We had tin can/string "telephones." We made things with wood and metal. Sometimes we used batteries and lethal AC. That is not done anymore - we can't- everything is digital or sealed beyond our reach. The inquisitive, energetic, creative, self-motivated experience has morphed into digital (thumb) games and messaging. Technology has surpassed that *experience and opportunity*.

But, Amateur Radio can meet a real-world need for opportunity and experience. What part of STEM does Amateur Radio not fulfill -

Amateur Radio has it all. We can provide that experience to youth, but we must be ever mindful of that perspective. The Youth Director will bring that perspective to RARS to continually look for Amateur Radio opportunities for youth. The Youth Director will coordinate RARS involvement with youth organizations such as the Boy Scouts, Girls Scouts and other youth groups.

Who will step forward to fill the Youth Director position? Who among our RARS members can take the lead to make sure we have a focus on the youth? Our nominations/elections start soon.

Education Director

Our Technician Class course ended up with 14 students and finished Sep 10. Curt Phillips, W4CP, was the instructor – thanks Curt.

Mike Murphy, WA4BPJ, is the instructor for the General Class course starting Oct 1 with follow-up sessions on the 8, 15, and 22. (The course consists of all four sessions.) The optional exam will be at 1:30 on Oct 22 conducted by the RARS VE team led by: Joe, WA4GIR, and Liz White, KO4CK, - thanks to you all.

The 2017 schedule will be determined by the end of 2016. It is anticipated that the Technician Class course will start in January and the Amateur Extra Class course will be toward the end of the 2017. The Technician Class and General Class courses are four, four-hour sessions; the Amateur Extra Class course is sev-

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Education Director

en, four-hour sessions. With two Technician Class and General Class courses each and one Amateur Extra Class course per year, that's 23 Sat morning hours – almost half a year! Plus the development time of the courses. That's a heck of a commitment and effort by our instructors, year-after-year, that is not in the view of our RARS members – thank you. What contribution can you make to RARS?

We are still looking for a new Education Director. You do not have to be licensed beyond the Technician Class and the position is mostly administrative and on the computer and attendance at all the sessions is not required.

73 Murray, K4MHM

RARS Receives Equipment Donation

RARS has received donations of equipment to assemble a working HF station for demonstrations and recruitment of new and upgraded hams.

Alan Pitegoff, AB4OZ, has donated an Icom IC-718 HF rig in memory of his late wife, Lynn Pitegoff, KO4QH (SK). Lynn was an active member of RARS until her untimely death in 2000. Among her many contributions to the club was a term as Education Director. It is only proper that a gift in her memory will be used to educate and attract new people to amateur radio.

To power the station, an Astron power supply was donated by the estate of Jack Ritter, WOUCE (SK). Jack was also a RARS member and was known for being an ex-

cellent mentor and Elmer to many hams over the years.

This station will be under the control of the RARS Education Director and will be used at demonstrations and other events related to RARS and amateur radio.

RARS is grateful to those who played a part in donating this equipment to further the exposure of amateur radio and also for the contributions made by Lynn and Jack to RARS and to amateur radio in general.

Dennis Keith

NC4DK

RARS President

Repeater Self-desense and how hams can detect it

Receiver desense is where a receiver is not able to hear signals on its channel as well as designed because a transmitter or noise source is affecting the receiver. It could also be caused by power-line noise.

Desense is a problem which in some sites is just not solvable. Our 444.525 repeater may be just such a case. That repeater is jammed by a subsystem related to the tower lights. It is only a problem at night. When the repeater is passing a ham's audio you can hear the buzz at the same on/off rate that the tower lights blink. Usually desense is not so obvious. Some receivers just don't seem to work well.

At my house using a roof-top omni, I noticed that if I run my IC2200H 2meter FM mobile on a gel-cell battery and turn off EVERYTHING else in the house, I can hear *much* better than if the IC2200H is on my power supply and the power is on to the usual appliances. My resolution to this problem was to put the antenna 60 feet away from the house on 150 feet of good coax cable. Now power supply and appliances in the house don't make any difference.

Repeater Self-desense is when a repeater's own transmitter is the noise source.

Self-desense is seen when the repeater receiver is more sensitive when the repeater is off the air than when the repeater itself is transmitting. The classic symptom of this is where a user station appears to be able to bring up the repeater, but their audio is not heard. It would sound like somebody kerchunking the repeater, or may be mistaken for a user station having a no microphone audio. However, if the user continues transmitting, the repeater will drop at the end of its hang-time (3 to 5 seconds) only to come back into transmit immediately, over and over. Depending on the speed of the squelch you might hear a squelch crash immediately each time the repeater comes on-line. Modern (fancy) repeater controllers mute the squelch crash so you don't hear anything, except maybe the repeater courtesy unkey beep, while the repeater transmitter cycles on and off with a cycle duration equaling the hang time of the repeater.

note: Repeater hang-time is how long the repeater remains transmitting after the user un-

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keys.

Mobile stations who are too weak to hold the repeater will *reliably* bring up the repeater while only passing broken audio, very noisily, if at all.

There are many causes of repeater self-desense. Most typical are leaks from the final output of the transmitter into the receiver that make their way around the duplexer. This can be caused by a single bad coaxial jumper, likely on the receiver side. A failure in receiver shielding, miss-tuned duplexer cavities, antenna placed too close to the receiver, bad grounding in the repeater itself, insufficiently filtered receiver, or a badly tuned antenna can also be culprits.

Testing for self-desense away from the repeater is very easy. Set up a base or mobile station that hears the repeater very well on the output. Set a low power transmitter, like an HT, and find a place where you can key and pass audio through the repeater (listen to yourself on your mobile or base station receiver) but are dropping out by obscuring the antenna (put the HT behind you or behind car

from the perspective of the repeater). If you find that even after you no longer pass audio, you still key the repeater, self-desense may be the problem. Read on. As you wave the portable and antenna from a dead spot to a strong spot you should hear the repeater come up and play weak-signal audio through, with noise, then either get stronger (better quieting/less noise), or if you get weaker, the repeater will drop. A repeater with no self-desense *should* never key up until it is able to pass at-least weak-signal audio. If the repeater is self-desensing, the dead zone where you are strong enough to key it up, but not strong enough to hold it (and pass audio) is very noticeable. A really badly self-desensed repeater will allow you to key it in low power, but won't pass audio until you step the power up a couple of levels. Try these tricks on several repeaters to learn how a repeater should behave. I wouldn't do it on a busy repeater. That would be wrong. Make sure you Identify and announce what you're going to do and perhaps mention that you're trying to learn. Identify when you are clear as well. A technical ham repeater owner will

be overjoyed that you have an interest. Lord knows we have enough repeaters that aren't used AT ALL, much less understood!

A more deterministic way to test for self-desense is with a switched 'step' attenuator in the line between your *low power* transmitter and a fixed antenna. Use the switched attenuator to adjust the signal a level where you are passing audio. Now start reducing the signal level (increasing attenuation) until the repeater drops and stays dropped. The delta between the two attenuator settings is a measurement of the self-desense. I said "fixed" antenna because if you are using an antenna where your actions change the performance or signal to the repeater, then the calibration on the attenuator is useless and you'll get very confusing results. See below for more on step attenuators.

At a repeater site, if there is a monitor speaker on the receiver, you can get somebody to transmit with a weak signal, then switch the transmitter on and off. In a repeater with no self-desense, keying the transmitter should make no difference to the received signal.

A well-equipped service person will have a signal generator. The steps to test with a signal generator would be to attach an antenna to the generator, adjust the generator power level to the point where the receiver COR trips, note the output level, and then further adjust the level until the COR stays open even while the transmitter is on. The delta between COR trips and COR stays open output level is the self-desense number. To be completely fair the test should be done with an antenna away from the repeater shed, and within the pattern of the antenna, but that is rarely performed in ham radio repeater testing. Zero self-desense is a great goal, an improvement is at least something. Knowing what self-desense numbers you are dealing with is a very handy thing.

In a hack ham radio repeater project, the builder/operators should have a pair of handie talkies and a selection of fixed attenuators and/or good and bad attachable ducky antennas. Waving an HT while transmitting and being very observant of what the repeater does, can be revealing. A step attenuator, as mentioned above, is very useful for testing your repeater. A step attenuator

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enables you to change your transmitted power from your low power, 0.25watts for instance, down to 0.0000000025 watts, but in small 1dB steps. 1dB is much less than halving the power in a step. Beware that if you attempt to attenuate your signal down by more than a couple of zeros, you may get RF leakage through the chassis of the radio with more signal than is passing through the attenuator to the antenna. Putting a rubber ducky on the end of the step attenuator may be silly for that reason. Be reasonable with your expectations.

For low power testing, less than 1/2 watt, step attenuators are very available at ham flea markets. KAY is a manufacturer whose step attenuators sometimes show up at flea markets. The common KAY step attenuator has half a dozen to a dozen toggle switches. The common models are capable of handling just less than half a watt of *input* power. Search on

the web for "KAY Step Attenuator". Beware that some attenuators are made for 90 ohms, 75ohms and others for 50ohms, even though they will likely have BNC connectors. A wrong impedance attenuator will still work, but the dBs of attenuation may not be as accurate. 50ohms is desirable. At a ham radio flea market a non-50ohm attenuator will be less expensive. A 75ohm KAY with 6 or more switches is probably worth \$30. Putting more power into the attenuator than it can stand may wreck it completely, or may cause the first 'closed' element to fail. Some flea-market-specials were made surplus (and inexpensive) because they have taken some damage. It is worth having the SMA/BNC adapters you'd need to test such a unit.

You can see self-desense in and with your own equipment. If you turn on a mobile receiver to listen to one of the local repeaters, then you key an HT on another frequency in



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the same band, you may hear the receive signal from the local repeater knocked down into the noise. This is the same affect that causes repeater self-desense. Depending on how strong the station is you are listening to, you can sometimes do this with an HT in your shack, or somebody in another mobile nearby. It is classic/ annoying/funny to have desense happen when following a friend but talking to them through a repeater. Eventually you get to a point where you can't hear the ham in the car next to you (through the repeater) because every time they key up your receiver goes dead. This is seen when everybody is leaving the ham club meeting all the same time.

Fun with vhf radios:

Here's an idea. Try acting as a repeater yourself, personally. Do you have two handie talkies laying around? Or couple of separate base station radios? Know a couple of other hams who like to play with VHF rigs? Try making a trivial repeater in between two other stations. Set one radio to transmit on 147.45Mhz (simplex channel usually). Set the other to receive on 146.85 (repeater output usually). Have a couple of your friends set up their radios to receive on

147.45 and transmit on 146.85 -- that's 147.45 with a MINUS 600 split. You set your own receiver on 146.85 and transmitter on 147.45 simplex. Hold the microphone of your 147.45 transmitter near the speaker of your 146.85 receiver. When one of your friends keys up on 146.85 you key up to repeat the audio onto 147.45. Try it in low power transmit first. Experiment. Is it better to use the good antenna for the transmitter? Or for the receiver? This is worth at least several minutes of amusement. You might get hooked and start working on your own repeater project! By the way, the closest 146.85 repeater is in Goldsboro NC. Since you are running this experiment on their output channel they are unlikely to be worried by it, but if you do this for more than once or twice it might be worth researching a less used frequency pair. Don't forget to ID your transmitter!

Check out <http://www.arrl.org/part-97-text> 97.119 97.205 are interesting bits.

73 Tadd Torborg, KA2DEW

Raleigh Amateur Radio Society
Board of Directors Meeting Minutes
July 19 , 2016

The meeting was called to order by president Dennis NC4DK at 7:05 p.m.

Present: Dennis NC4DK, John AI4RT, Joanne AK4RJ, Bill AK4BL, Murray K4MHM, Chuck K4HF, Hank K4HM, Karl W4CHX, and Bob NC1X which group represented a quorum, and visitors Selene KG4RMT and Allen AB4OZ.

The minutes of the May 2016 and June 2016 meetings were approved as distributed.

Vice President (by e-mail) Tom N4TL has sent out updated lists of presentations for this year and next. The deadline for the Exciter is July 30. Please send any articles to Tom.

Treasurer: (by e-mail) Membership was 448 before the fiscal year ended and with it many memberships. Today the membership is 281 not counting the renewals received last week at the membership meeting. See Greg for any other treasury details.

Secretary – no report

Directors' Reports:

Public Service: John AI4RT reports the Cup 'n Cone tour will be this Saturday, July 23. Another Public Service event is scheduled the following Saturday, July 30.

Education: Murray K4MHM says the Technician class starts August 6 with 3 persons registered. He sent an e-mail to those who expressed interest but have not registered. The class will be 4 sessions over a period of six weeks. The General class starts the first week in October. There will be no more classes in 2016. All the classes are at the Wake Tech beltline education center in the old factory.

PIO (absent): the brochures still need to be completed.

FM Repeater: Karl W4CHX reviewed the repeater status. The 145.13 repeater works fine, but one run of hardline coax needs to be replaced and the antennas are questionable; therefore, the status of cross link operations by the 145.13 repeater is not clear. It is possible that commercial quality antennas need to be installed. Karl W4CHX has asked for a quote. He estimates 5K or 6K dollars. The question of moving the 146.64 repeater is still not clear. We have been informed that when the NCSHP tower on Blue Ridge is moved, we will need to find another repeater site; another individual has said our repeater will be moved along with the other State communication systems. Presently, it is not known if or when the current NCSHP tower will be relocated and nothing is in writing. Recently, it has been learned there is the potential for co-location of a RARS repeater in a City of Raleigh communication facility located in the downtown area. After further discussion, it was decided that RARS should investigate the possibility, and feasibility, for locating one of the RARS repeaters at the alternate City of Raleigh site.

Food Service: Joanne AK4RJ – no report. Dennis NC4DK remarked on the continuing quality of the food at meetings.

ARRL liaison: Chuck K4HF reports the FCC has turned down a request for lifetime amateur licenses.

NC Section: Karl W4CHX reports the Amateur Radio Parity Act has been voted out of the Science & Technology committee of the House, and should be voted on by the full house the first week that congress reconvenes. The major opponent is the Community Association Institute. The ARRL plans a major push to have individual members contact representatives at a future date which the ARRL has not revealed.

Webmaster: Hank K4HM has put a version of his proposed photo gallery on the RARS site. He continues to debug the error log and remove extraneous error log code. He is working on tracking ticket stubs from RARSfest. Hank would like to have some sort of virtual presence system for the board meetings, as he travels a lot.

Field Day: Dennis NC4DK says Field Day was a success. It was our 20th consecutive year at the Carroll farm. Propagation was down some from last year but then all propagation seems to be diminishing. Food was excellent. It might be possible to combine with OCRA and Durham FM in some future year in a central location. A winter field day

might be a way to test this. The benefit would be interaction among clubs and more band/mode/time coverage.

NC QSO Party: A meeting has been set up with South Carolina as reported at the membership meeting by Marty W4MY who was not in attendance.

Old Business:

Shirts: Murray K4MHM reports the initial order is complete. Subsequent orders are to be by the RARS website, where Hank K4HM has put an order form in the Members Only section.

Patches: Murray received a sample patch and a quote in the mail. He does not like the execution of the sample patch, and the Board agreed by declining to accept the new patch. Other sources will be pursued. The Cape Fear club has an excellent patch; their vendor is a military patch vendor and may be worth investigating.

New Business:

Murray K4MHM recommended that the position of Youth Director be established. We need to keep RARS activities oriented toward youth and promote outreach to youth so the club does not age away. He recommends the new director be separate from the Scouting director. After some discussion Murray agreed to present a job description to a future board meeting for consideration.

Allen AB4OZ donated an IC718 transceiver with accessories to the club in memory of his late wife Lynn. Tom N4TL donated a power supply for this radio. The Board is very appreciative of these donations.

The next Board Meeting will be Tuesday, August 16, at 7:00 p.m. at the church.
The meeting was adjourned by president Dennis NC4DK at 9:50 p.m.

Respectfully submitted,
Robert E Chapman, NC1X
RARS Secretary

MINUTES

Raleigh Amateur Radio Society General Membership Meeting August 9, 2016

The meeting was called to order by President Dennis NC4DK at 7:35 p.m.

There were 55 members present, which constituted a quorum. A motion to accept the minutes of the July 12 meeting, as published in the Exciter, was made, seconded, and approved.

Vice President Tom N4TL announced that the program for the next membership meeting, to be held September 13, will be “Modern Methods for Learning Morse Code”, to be given by Dan N3ND.

Treasurer Greg KE4PAX was absent. Dennis NC4DK reported that we have 290 members compared with 448 last year, and surmised that we need a bunch of people to renew their memberships. Renewal can be accomplished online through the RARS website or by cash or check at the next meeting.

Murray K4MHM announced he has several unclaimed but paid-up Club Shirts. They should be picked up from Murray.

Board and Committee Reports:

Public Service: John AI4RT said we are in the middle of Public Service season, with

Continued on the next page

two events next Saturday.

Education: Murray K4MHM reports the General class will start in early October. A Technician class is in progress with 13 students in it.

Field Day: Dennis NC4DK reports this year's Field Day is in the books with all logs submitted. Even though Field Day is not a contest, the results will be reported in the December issue of QST as if it were one.

FM Repeater: Karl W4CHX reports the 145.13 repeater is on the air as a standalone to provide better RTP coverage. It will eventually be crosslinked with the 146.64 repeater when new hardline can be installed. All our repeaters have been repaired and should be swapped out; loaners should be returned. The 444.525 machine now has an 82.5Hz PL tone. Chuck W3WZN, Danny K4ITL, and Charles NC4CD contributed greatly to this project's success. Rumors of a tower move at the Vet School (Fairgrounds) remain rumors, but alternate locations are being investigated.

N.C. QSO Party: There will be a meeting with the South Carolina QSO Party organizers at the Shelby Hamfest. A North Carolina meeting will occur in November. The 2017 QSO Party will be February 24-27.

Other Business:

Karl W4CHX is looking for anyone who doesn't get the ARRL section newsletter. He wants them to sign up for division and section news so they can participate in the push to get the Amateur Radio Parity Act passed. There will soon be action on this bill, HR 1301, which has come out of subcommittee into the full committee, but is stalled by opposition from HOA groups. It will probably be acted upon in the first half of September. All should keep looking

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in mailboxes for communications.

Guests: Don N8DDK and family; Joe and Donna who are students in the ongoing Technician class; Diana and Robin who just passed the Technician at a VE session; Matt KE5BNR; Paul AH6LS; Rick, a former member of RARS; and Jim (NC).

Door prizes: Lowell, K4EUP chose the PSK31 Guide. Robin (no call) won the ARRL calendar which is still half useful. Matt KE5BNZ chose the \$25 gift certificate. Frank KA2FWC chose the RFI Guide.

Program: Tom N4TL introduced Fred Benson NC4FB, who gave a presentation on Antenna modeling. The presentation had a lot of detail on slides and can be found on NC4FB.org with a password of "rars". Fred described the origin and evolution antenna modeling and then worked through an example based on the use of AutoEZ and EZNEC, which are relatively inexpensive programs for modeling. A free app called 4nec2 is available.

The meeting was adjourned by President Dennis NC4DK at 9:33 p.m.

Respectfully Submitted,
Robert E Chapman, NC1X
Secretary

Current Public Service Opportunities

To volunteer for a Public Service event please go to the RARS website and complete the form at the top of this page. <http://www.rars.org/public-service.php>

The Ham Public Service Net The HPS Net is on vacation, we will resume when the 2016 PS season begins. We will use the following repeaters in the Carolina 440 Link System:

441.725(+)(100) – Raleigh, NC Hub
443.450 (+)(100) – Cane Mt., Snow Camp, NC
444.325 (+)(100) – Holly Springs, NC
444.375 (+)(100) - Henderson, NC
444.550 (+)(100) – Coats, NC
444.775 (+)(100 – Cary, NC
444.875 (+)(100) – Wendell, NC
145.330 (-)(100) – Goldsboro, NC
442.250 (+)(107.2) - McCain/Southern Pines, NC
444.200 (+)(179.9) - Johnsonville, NC
444.025 (+)(100) - Benson, NC
442.425 (+)(100) - Buxton, NC

(The net is also accessible through IRLP Reflector 9210)

The Ham Public Service Yahoo Group link is: [Ham Public Service North Carolina](#)

Choose the event(s) for which you would like to volunteer and complete the sign-up form at the RARS website .. note... one form for *EACH event* that you are volunteering. We are glad you are back. <http://www.rars.org/public-service.php>

*** TO VOLUNTEER FOR ANY OF THESE EVENTS ON THE NEXT PAGE
FILL OUT THE FORM AT <http://www.rars.org/public-service.php>**

Public Service Continued from the previous page

2016 MS BIKE RIDE

September 10 & 11, 2016 - Saturday & Sunday - New Bern, NC

FILL OUT THE FORM AT <http://www.rars.org/public-service.php>

2016 CFF CYCLE FOR LIFE

September 24, 2016 - Saturday - Raleigh, NC

FILL OUT THE FORM AT <http://www.rars.org/public-service.php>

2016 LE TOUR DE FEMME

October 8, 2016 - Saturday - Apex, NC

FILL OUT THE FORM AT <http://www.rars.org/public-service.php>

2016 NCBC FALL RALLY

October 16, 2016 - Sunday - Holly Springs, NC

FILL OUT THE FORM AT <http://www.rars.org/public-service.php>

RARS Classified

The items below were listed within the last 30 days on the

Jetstream JTNMO220 antenna

Posted September 5th, 2016 by: WZ0Q

Contact: wz0q@outlook.com

Jetstream 220mhz antenna. Model # jtnmo220.

New bought in July, sold 220mhz radio so I do not need antenna.

Comes with magmount base. asking \$20.00

984-200-4531

wz0q

Mic's for sale

Posted August 20th, 2016 by: WZ0Q

Contact: wz0q@outlook.com

Mics for sale

I have 4 mics for sale.

1-Uniden mic, 4 pin round connector. \$15.00

1-Icom HM 46 Speakermic. \$10.00.

2-Azden model# 499-23 hand mic's with DTMF keypad.

Both work fine bus.

Asking \$10.00 each.

Or make reasonable Offer for all.

984-200-4531

Dennis

650 Watt Computer Power Supply

Posted August 19th, 2016 by: W4NPN

Contact: fbW4NPN@gmail.com

I have a 650 watt computer power supply (12 and 5 volt outputs at many amps). Would make a nice supply for your shop. If anyone wants it I am in Chapel Hill & you can pick it up there.

fbw4npn@gmail.com

Frank

W4NPN

DMR Items

Posted August 16th, 2016 by: W4ZWA

Contact: w4zwa@yahoo.com

Connect Systems CS800 DMR Mobile - \$250

Tytera MD-380 DMR Handheld - \$75

\$300 for both

Both are loaded with the NCPRN code plug and include programming cables, chargers, and such.

Bought thinking I would get back into FM only to have used the HT once and the mobile never. CS800 is about 2 week sold and HT is about 3 months old.

w4zwa@yahoo.com